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Short-, mid-, and long-term outcomes of suburethral slings with concomitant pelvic organ prolapse surgeries

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Abstract:

BACKGROUND: This retrospective cohort study assessed the outcomes of combined surgeries for pelvic organ prolapse (POP) and stress urinary incontinence (SUI) in 31 patients with a follow-up of 7 years.

OBJECTIVE: The study aimed to determine the success and recurrence rates of POP and SUI while comparing the outcomes, analyzing the predictors for recurrence, and reporting on complications.

MATERIALS AND METHODS: Demographic and clinical profiles were analyzed descriptively using frequency and percentages. Objective SUI cure rate was assessed via office cystometry with a cough stress test, while POP was evaluated using the POP-Q system. Subjective cure rates for both conditions were determined using a symptom severity checklist based on the King's Health Questionnaire. Chi-square tests assessed associations between objective outcome parameters and time elapsed since surgery, and other outcome predictors, with significance set at $p < 0.05$.

RESULTS: The results showed a high objective cure rate of 96% for SUI and subjective cure rates of 96% for both SUI and POP. Long-term symptoms included urine frequency and retention, while mesh erosion occurred in one patient. The objective cure rate for POP was 67.7%, with recurrence in the anterior compartment at the midterm and in various compartments at long term. Vault fixation suggests efficacy in reducing apical prolapse recurrence. The preoperative age was identified as a significant risk factor for POP recurrence.

CONCLUSION: This study supports the durability and efficacy of combined surgeries for SUI and POP, with high patient satisfaction.

Keywords:

Filipino women, long-term outcome, mid-, short-, suburethral sling and prolapse surgery

Introduction

Pelvic floor dysfunction (PFD) which includes stress urinary incontinence (SUI) and pelvic organ prolapse (POP) negatively affects the quality of life (QOL) of women. However, the prevalence rates of PFDs differ as a result of varied methods used in reports, poor health-seeking behavior of women for PFD symptoms, and providers underdiagnosing these conditions.^[1] For example, international studies on SUI seem

to converge on a prevalence of 30%.^[2] In China alone, reports vary from 8.7% to 69.8% in a review of published studies,^[3] or equivalent to 43–349 million women.^[4] In the Philippines, a population based survey among community dwellers was conducted by Sumilang et al. which reported women with symptoms of SUI and POP at 11.32% and 6.6%, respectively.^[5] Meanwhile, the Division of Urogynecology and Pelvic Reconstructive Surgery in a Philippine tertiary hospital (Annual Reports, 2017–2022, unpublished data), reports the symptoms of both SUI and POP in 52.10% of their new outpatient consults, with 24.23% of these

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women with co-existing SUI and POP undergoing surgery.

This study aims to evaluate the success and recurrence rates of continence and prolapse surgeries at short-, mid-, and long-term follow-up. Understanding these outcomes is crucial for improving patients' QOL and guiding surgical decision-making.

Objectives

The authors intended to compare the outcomes among women seen at short-term (within 2 years), mid-term (3 to 5 years), and long-term (>5 years) follow-up. The follow-up intervals have been assigned as such based on available systematic reviews which report failure rates overtime for both mid-urethral slings (MUS) and pubovaginal slings ranging from 12.5% at 1 year to 57% at 5 years after surgery.^[5]

The primary objective is to report on the success and recurrence rates of both continence and POP surgeries upon follow-up using the objective outcome parameters such as office cystometry with cough stress test, followed by straight catheterization, POP quantification (POPQ) scoring, and combining it with a subjective outcome parameter by using a symptom severity checklist. The secondary objective is to analyze the possible predictors for the recurrence of SUI and POP and report on complications, especially in relation to the duration of time from surgery.

Materials and Methods

This retrospective cohort study was conducted in a Philippine tertiary center, approved by the institution's Research Ethics Board. The study included women diagnosed with urodynamic incontinence and POP, who underwent incontinence procedures concomitant with a prolapse surgery from 2010 to 2020.

The International Continence Society defines urodynamic SUI as the finding of involuntary leakage during filling cystometry, associated with increased intra-abdominal pressure in the absence of detrusor contraction.^[6] The term "urodynamics" is a general phrase used to describe a group of tests that assess the filling and voiding phase of the micturition reflex. The most sophisticated of which is multichannel urodynamics which provides simultaneous measurement of pressure from multiple sites during bladder filling and emptying and allows precise measurement of intravesical, intraurethral, and intra-abdominal pressure for a more precise analysis of lower urinary tract function.

However, office-type cystometry combined with cough stress test is a simple procedure that can demonstrate involuntary leakage in the test setting.^[7] The equipment needed in an office-type cystometry includes an infusing stand, sterile infusion fluid, with the filling tube connected to a Fr. 10 Foley catheter introduced transurethral into the bladder. A transducer is attached to the filling tube and

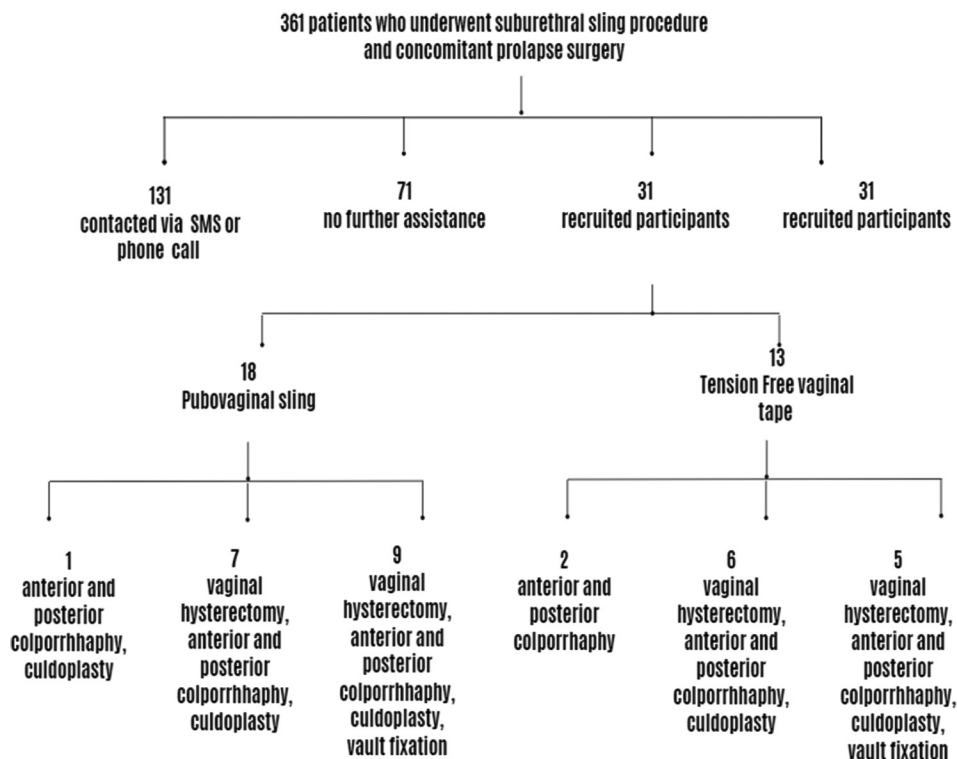


Figure 1: Summary of subject inclusion and exclusion based on type of surgery

Table 1: Demographic data and characteristics of Filipino women

Characteristics	Frequency (%)
Age (years), mean±SD during study	66.35 (7.7)
Education	
College	5 (16.1)
Grade school	11 (35.5)
High school	13 (41.9)
Vocational	2 (6.5)
Employment	
Barangay official	1 (3.2)
Fish vendor	1 (3.2)
Fruit vendor	1 (3.2)
Gardener	1 (3.2)
Housemaid	2 (6.5)
Housewife	6 (19.4)
Kitchen staff	1 (3.2)
Laundrywoman	1 (3.2)
Nurse assistant	1 (3.2)
Retired	1 (3.2)
Store owner	3 (9.7)
Unemployed	12 (38.7)
Smoking	0
Comorbidities	
Bronchial asthma	1 (3.2)
Chronic venous insufficiency	1 (3.2)
Diabetes mellitus	4 (12.8)
Dyslipidemia	5 (16)
Hyperuricemia	1 (3.2)
Hypertension	9 (29.0)
Hinman syndrome	1 (3.2)
Ischemic heart disease	1 (3.2)
Peripheral arterial occlusive disease	1 (3.2)
Trigeminal neuralgia; spondylolisthesis L4–L5	1 (3.2)
Vaginal births	
1	1 (3.2)
2	5 (16.1)
3	4 (12.9)
4	7 (22.6)
5	7 (22.6)
6	5 (16.1)
8	2 (6.5)
BMI	
18	2 (6.5)
19	2 (6.5)
20	3 (9.7)
21	4 (12.9)
22	4 (12.9)
23	3 (9.7)
24	5 (16.1)
25	2 (6.5)
26	1 (3.2)
27	4 (12.9)
29	1 (3.2)

BMI: Body mass index, SD: Standard deviation

fixed against a measuring tape placed vertically against the infusing stand for pressure measurement.

Table 2: Distribution of participants by duration in years from surgery of incontinence procedure and concomitant pelvic organ prolapse surgeries in Filipino women

Years from surgery	Frequency (%)
Short-term	4 (12.9)
3–5 years	10 (32.3)
Long-term	17 (54.8)

All patients had no urinary tract infection (UTI) on microscopic urinalysis. Patients were then asked to void, followed by residual volume measurement with a Fr. 16 Foley catheter. The patients then chose a comfortable position on the examining table, all equipment installed, all tubes water filled, with the zero of the pressure line positioned at the bladder level. For patients with recurrent POP, a ring pessary was inserted per vagina. The patient’s bladder is gradually filled at a medium filling rate until functional bladder capacity is reached. However, for patients who have urgency symptoms, a slower filling rate was used. During bladder filling, the patient is asked to report her first sensation of bladder filling, first desire to void, strong desire to void, and maximal bladder capacity and asked to cough each time at these volumes to assess for urine leakage. A positive result indicates urodynamic SUI, while a positive result after prolapse reduction indicates occult SUI. Upon reaching cystometric capacity, patients were allowed to void, followed by straight catheterization to determine postvoid residual.

On the other hand, POP is defined as the descent of one or more of the anterior vaginal wall, posterior vaginal wall, the uterus (cervix), or the apex of the vagina (vault). POPQ scoring is the standard way to describe the descent of prolapse with respect to specific anatomical landmarks and is used to evaluate the success of prolapse surgeries.^[8] Recurrence of prolapse was defined as prolapse of any of the anterior, posterior, and/or apical vaginal compartments at a point 1 cm proximal to, or 1 cm distal to the hymen, or stage 2 of the ordinal staging system. Other findings such as mesh erosion or ulcerations were noted.

Finally, the King’s Health Questionnaire (KHQ)^[9] with 24 questions on urinary, bowel, and vaginal characteristics is a validated tool used in clinics and research to evaluate outcomes of urinary incontinence (UI) surgery. A local symptom severity checklist based on the KHQ was used in the study because the target population of patients for this retrospective study had already answered it preoperatively. Using the same questionnaire, procedures, and tests as before, the authors hoped to encourage more participants to join the study, as these steps were similar to a regular check-up.

Purposive sampling was used in this study, ideally, at least 230 participants were needed for the study to have an 80% level of power. The hypothesized frequency of symptomatic condition was set at 15% based on empiric observation of the researcher. However, the researchers found that a more prudent approach was to include all 361 eligible women within the 10-year period. Exclusions were made for patients with invalid/unreachable phone numbers, logistical issues, and personal reasons.

Participants were contacted through teleconsultation to explain the research objectives and obtain initial verbal consent. Upon recruitment, an updated information data form documenting demographic data of each patient were completed, followed by answering the symptom severity checklist. Upon face-to-face consultation, written consent was secured followed by POP-Q scoring, office-type cystometry with cough stress test, and postvoid determination.

Descriptive analysis and Chi-square tests were performed to analyze the data. $P < 0.05$ was considered statistically significant.

Results

Out of the targeted subjects for the study, 131 women had valid contact information. However, only 31 women responded and were included in the study [Figure 1]. The participants were divided into different groups based on the type of surgery and the time elapsed since the procedure [Figure 2]. The average age of the participants was 66.35 years (standard deviation 7.7 years), with 41.9% being high school graduates [Table 1]. There were 17 (54.8%) with the long-term follow-up from surgery [Table 2].

The objective and subjective cure rates of continence procedures were 96% (30 out of 31) and 96% (30 out of 31), respectively, whereas 94% (29 out of 31) had normal office cystometry and no symptoms of stress incontinence. On office cystometry with cough stress test, one patient (3.2%) had occult stress incontinence, 1 (3.2%) patient had urine retention, while 7 (22.5%) demonstrated small bladder capacities [Table 3.1]. On symptom severity checklist, three patients (9.7%) reported urgency, one patient (3.2%) had occasional stress incontinence, while two patients (6.5%) reported weak stream. There is an association with urinary frequency from duration of time from surgery with $P = 0.027$, with 10 patients (58.8%) having urine frequency of every 2 h seen at the long-term follow-up.

The objective and subjective cure rates of concomitant prolapse surgeries were 67.7% (21 out of 31) and 94% (29

Table 3.1: Outcomes of office cystometry

Office cystometry result	Frequency (%)
Recurrent stress incontinence (occult)	1 (3.2)
Stable bladder	22 (71.0)
Stable bladder; R/O voiding dysfunction (40% retention)	1 (3.2)
T/C small bladder capacity	7 (22.5)

out of 31), respectively, while 67.7% (21 out of 31) had no recurrence on POP-Q [Table 5.1] and no POP symptoms [Table 4].

All patients had vaginal culdoplasty, 15 of whom had bilateral iliococcygeal fixation (BICF) [Table 5.2]. There were 12 out of 15 cases (80%) who had BICF without apical prolapse recurrence and 3 out of 15 cases (20%) who had BICF but had apical prolapse recurrence at long term. There was not enough evidence to show that opting out BICF is associated with apical prolapse recurrence ($P = 0.066$). There was not enough evidence to show that fixation is associated with anterior compartment prolapse recurrence ($P = 0.411$).

Out of the 31 patients, one patient both had occult stress incontinence and POP recurrence objectively but with no complaints of either urine leakage or prolapse symptoms at the long-term follow-up.

In addition, there is no evidence of significant differences in the occurrence of other vaginal symptoms, such as dyspareunia, coital incontinence, vaginal pain, vaginal discharge, or abdominal/pelvic discomfort/sensation of vaginal laxity, among the different durations of follow-up [Table 4].

Similarly, there are no significant differences in the occurrence of bowel symptoms, including fecal urgency, fecal incontinence, flatal incontinence, straining to defecate, constipation, sensation of incomplete emptying, digitation, or splinting, across the different durations of follow-up [Table 4].

Only preoperative age of 54.87 ± 2.45 years old was statistically significant to predict prolapse recurrence ($P = 0.004$) [Tables 6.1–6.3]. Mesh erosion occurred in one patient (3.2%) seen at the short-term follow-up who required mesh trimming and vaginal estrogen. One (3.2%) patient seen at the long-term follow-up had significant urine retention on office cystometry. No patients were given antimuscarinic medication.

Discussion

PFD which includes SUI and POP negatively affects the QOL of women. In cases where surgical candidates

Table 3.2: Stress urinary incontinence recurrence

			Years from surgery			Total
			Short-term (<3 years)	Mid-term (3 to 5 years)	Long-term (>5 years)	
Incontinence	Mixed (stress predominant)	Count	1	1	1	3
		# within years from surgery	25%	10%	5.9%	9.7%
	Occult	Count	2	1	1	4
		# within years from surgery	50%	10%	5.9%	12.9%
	Urodynamic	Count	1	8	15	24
		# within years from surgery	25%	80%	88.2%	77.4%
Total		Count	4	10	17	31
		# within years from surgery	100%	100%	100%	100%

	Value	df	Asymp. Sig (2-sided)
Pearson Chi-square	7.891a	4	0.096
Likelihood Ratio	6.492	4	0.165
Never of valid cases	31		

^a7 cells (77.8%) have expected count less than 5. The minimum expected count is 0.39

Table 3.3: Stress urinary incontinence recurrence risk factors – vaginal births

Vaginal births				
Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
1	1	3.2	3.2	3.2
2	5	16.1	16.1	19.4
3	4	12.9	12.9	32.3
4	7	22.6	22.6	54.8
5	7	22.6	22.6	77.4
6	5	16.1	16.1	93.5
8	2	6.5	6.5	100.0
Total	31	100.0	100.0	

Limitations of the analysis due to the presence of cells with unsatisfactory expected counts, which may affect the reliability of the results

have preoperative SUI and POP, a practical approach is to perform both procedures concurrently. To do this, preoperative stress testing is done with prolapse reduction to confirm reported SUI or unmask occult SUI. This practice is based on works such as Wei *et al.*^[10] wherein a prophylactic MUS inserted during vaginal prolapse surgery resulted in a lower rate of UI at 3 and 12 months.

However, the outcomes following vaginal prolapse repair and MUS trial^[11] revealed higher rates of adverse events related to the sling procedure, including bladder perforation, UTI, major bleeding complications, longer operative time, increased blood loss, and mesh erosion. Other studies^[12,13] have reported increased lower urinary tract symptoms in women who undergo concomitant repairs, such as increased voiding frequency and urgency. Some studies^[13,14] have also observed an increased risk of postoperative outlet obstruction and prolonged catheterization in patients who undergo a one-step procedure for SUI and POP. Therefore, it is important to counsel patients about the long-lasting

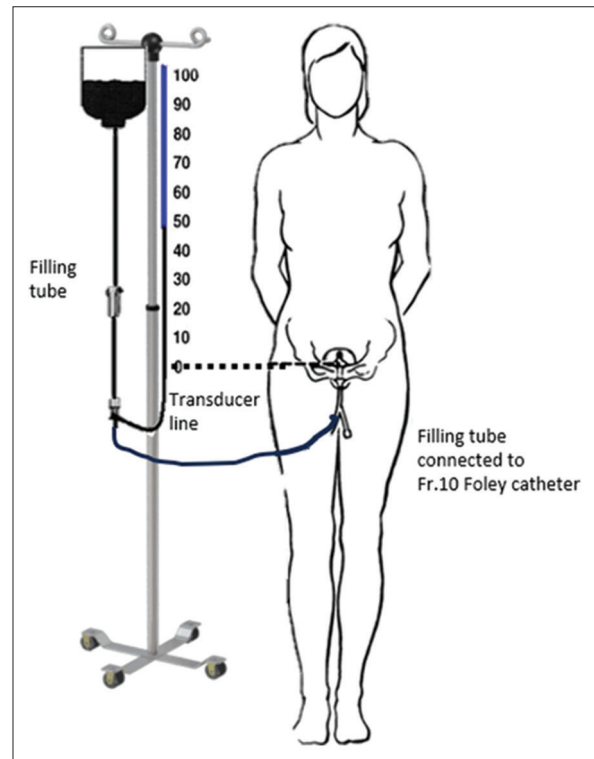


Figure 2: Illustration of simple office-type cystometry

improvement offered by incontinence and concomitant POP surgeries when recommending surgical options.

In addition, for patients with advanced uterovaginal prolapse and other complications such as obstructive uropathy, recurrent UTIs, cystolithiasis, and severe vaginal ulcerations with bleeding, the usual option is to address the more bothersome prolapse first and evaluate SUI after 3 months similar to systematic reviews comparing combined surgeries versus prolapse surgery alone by van der Pleg *et al.*^[15] and published work of Casiano *et al.*^[16]

To our knowledge, this is the first local study on the outcomes of concomitant SUI and POP surgeries. Conducting a randomized or prospective trial to determine the success rates of these combined procedures

Table 3.4: Risk factors for stress urinary incontinence
SUI recurrence risk factors – menopause

Valid	Frequency	Percentage	Valid percentage	Cumulative percentage
46	1	3.2	3.2	3.2
41	1	3.2	3.2	6.5
42	1	3.2	3.2	9.7
43	1	3.2	3.2	12.9
45	2	6.5	6.5	19.4
47	5	16.1	16.1	35.5
48	2	6.5	6.5	41.9
49	4	12.9	12.9	54.8
50	5	16.1	16.1	71.0
51	1	3.2	3.2	74.2
52	2	6.5	6.5	80.6
53	1	3.2	3.2	83.9
54	2	6.5	6.5	90.3
55	1	3.2	3.2	93.5
58	2	6.5	6.5	100.0
Total	31	100.0	100.0	

SUI recurrence risk factors – BMI

18	2	6.5	6.5	6.5
19	2	6.5	6.5	13
20	3	9.7	9.7	22.7
21	4	12.9	12.9	35.6
22	4	12.9	12.9	48.5
23	3	9.7	9.7	58.2
24	5	16.1	16.1	74.3
25	2	6.5	6.5	80.8
26	1	3.2	3.2	84
27	4	12.9	12.9	96.9
29	1	3.2	3.2	100.00
Total	31	100.00	100.00	

Limitations of the analysis due to the presence of cells with unsatisfactory expected counts, which may affect the reliability of the results. BMI: Body mass index, SUI: Stress urinary incontinence

may be challenging due to various factors, including a heterogeneous population, selection bias, time, cost, and the impact of the COVID-19 pandemic. For example, the age range of the target population (62–72 years) is associated with a higher risk^[17] of hospitalization from COVID-19 infection. This may discourage some patients from seeking follow-up visits for a condition that may seem less bothersome compared to the risk of contracting a potentially deadly infection.

Alatraca-Malonzo *et al.*^[18] did a local retrospective study which measured continence rates using cough stress test and pad weight test at least 1 year after continence surgery. It showed 100% negative cough stress test for patients in the Burch colposuspension, and MUS group, and 90.0% for those in the pubovaginal sling group. However, their study did not analyze the factors such as stage of prolapse during the study and prolapse procedure performed. Similarly, a recent multicenter study^[19] evaluated the clinical outcomes of women with high-risk predictors for postoperative SUI and

Table 3.5: Stress urinary incontinence recurrence risk factors – lifestyle/occupation

Valid	Occupation		Valid percentage	Cumulative percentage
	Frequency	Percentage		
Baranggay official	1	3.2	3.2	3.2
Fish vendor	1	3.2	3.2	6.5
Fruit vendor	1	3.2	3.2	9.7
Gardener	1	3.2	3.2	12.9
Housemaid	2	6.5	6.5	19.4
Housewife	6	19.4	19.4	38.7
Kitchen staff	1	3.2	3.2	41.9
Laundrywoman	1	3.2	3.2	45.2
Nurse assistant	1	3.2	3.2	48.4
Retired	1	3.2	3.2	51.6
Store owner	3	9.7	9.7	61.3
Unemployed	12	38.7	38.7	100.0
Total	31	100.0	100.0	

Limitations of the analysis due to the presence of cells with unsatisfactory expected counts, which may affect the reliability of the results

divided their subjects between continent women who had prophylactic MUS during POP surgery, versus continent women who had POP surgery only. This study by Lo *et al.*^[19] used multi-channel urodynamics, pad tests, and validated QOL questionnaires. They were able to recruit 20 patients for their MUS + POP surgery arm, with 95% continence rates at a 1-year follow-up. However, their study did not include patients with preoperative urodynamic SUI or other forms of incontinence.

A study by Braga *et al.*^[20] reported good clinical evaluation of synthetic suburethral slings at different time points up to 20-year follow-up but excluded patients with POP and mixed UI. They did a cough stress test to report objective cure and defined their subjective outcomes using the International Consultation of Incontinence Questionnaire – Short Form and a patient satisfaction scale.

In contrast to these studies,^[18-20] the authors included patients who have urodynamic SUI, occult SUI, mixed UI with predominant SUI, and those with co-existent POP. The authors also used office-type cystometry combined with cough stress test as this procedure allows the identification of stress incontinence and measures the various parameters such as the volumes at which coarse sensations and bladder capacity are reached. This was followed by straight catheterization to detect possible voiding dysfunction.

In this study, the objective and subjective cure rate of the continence procedures was 96.7% with an average of 7-year follow-up. This is higher than a systematic and meta-analysis study by Novara *et al.*^[21] which reported an 85% success rate at a median follow-up of 2 years. However, suggested risk factors for SUI recurrence^[21,22] such as older age, history of vaginal delivery, and

Table 4: Urinary symptoms by duration

	Duration (years)			Total	P
	Short-term <3, n (%)	Mid-term 3–5, n (%)	Long-term >5, n (%)		
Urinary symptoms					
Frequency					
Missing	0	1 (10)	0	1 (3.2)	0.027
Every 2 h	0	2 (20)	10 (58.8)	12 (38.7)	
Every 3 h	4 (100.0)	3 (30)	5 (29.4)	12 (38.7)	
Every 4 h	0	4 (40)	2 (11.8)	6 (19.4)	
Nocturia					
Abnormal	2 (50.0)	8 (80)	8 (47.1)	18 (58.1)	0.089
Normal	1 (25.0)	1 (10)	9 (52.9)	11 (35.5)	
Urgency					
Always	0	1 (10)	2 (11.8)	3 (9.7)	0.851
Never	3 (75.0)	6 (60)	8 (47.1)	17 (54.8)	
Occasionally	1 (25.0)	3 (30)	7 (41.2)	11 (35.5)	
Urge incontinence					
Always	0	0	2 (11.8)	2 (6.5)	0.759
Never	3 (75.0)	7 (70)	10 (58.8)	20 (64.5)	
Occasionally	1 (25.0)	3 (30)	5 (29.4)	9 (29.0)	
Stress incontinence					
Never	4 (100.0)	9 (90)	17 (100.0)	30 (96.8)	0.338
Occasionally	0	1 (10)	0	1 (3.2)	
Never enuresis	4 (100.0)	10 (100)	17 (100.0)	31 (100.0)	
Never straining to void	4 (100.0)	10 (100)	17 (100.0)	31 (100.0)	
Poor stream					
Always	0	0	2 (11.8)	2 (6.5)	0.200
Never	4 (100.0)	8 (80)	15 (88.2)	27 (87.1)	
Occasionally	0	2 (20)	0	2 (6.5)	
Sensation of incomplete emptying					
Always	0	1 (10)	1 (5.9)	2 (6.5)	0.608
Never	4 (100.0)	8 (80)	10 (58.8)	22 (71.0)	
Occasionally	0	1 (10)	4 (23.5)	5 (16.1)	
Weekly	0	0	2 (11.8)	2 (6.5)	
Dysuria					
Never	4 (100.0)	9 (90)	17 (100.0)	30 (96.8)	0.338
Occasionally	0	1 (10)	0	1 (3.2)	
Hematuria					
Never	4 (100.0)	9 (90)	16 (94.1)	29 (93.5)	0.781
Occasionally	0	1 (10)	1 (5.9)	2 (6.5)	
Vaginal symptoms					
Dyspareunia					
Never	4 (100)	9 (90)	14 (82)	27 (87)	0.319
Occasionally	0	0	3 (18)	3 (10)	
Weekly	0	1 (10)	0	1 (3)	
Coital incontinence					
Never	4 (100)	9 (90)	17 (100)	30 (97)	0.338
Occasionally	0	1 (10)	0	1 (3)	
Vaginal pain					
Never	4 (100)	8 (80)	17 (100)	29 (94)	0.344
Occasionally	0	1 (10)	0	1 (3)	
Weekly	0	1 (10)	0	1 (3)	
Vaginal discharge					
Never	2 (50)	9 (90)	15 (88)	26 (84)	0.081
Occasionally	2 (50)	1 (10)	2 (12)	5 (16)	
Never vaginal bleeding	4 (100)	10 (100)	17 (100)	31 (100)	

Contd...

Table 4: Contd...

	Duration (years)			Total	P
	Short-term <3, n (%)	Mid-term 3–5, n (%)	Long-term >5, n (%)		
Abdominal/pelvic discomfort/sensation of vaginal laxity					
Always	0	1 (10)	0	1 (3)	0.338
Never	4 (100)	9 (90)	17 (100)	30 (97)	
Sensation of prolapse					
Never	4 (100)	9 (90)	16 (94)	29 (94)	0.781
Occasionally	0	1 (10)	1 (6)	2 (6)	
Bowel symptoms					
Fecal urgency					
Never	3 (75)	10 (100)	15 (88)	28 (90)	0.3278
Occasionally	1 (25)	0	2 (12)	3 (10)	
Fecal incontinence					
Never	4 (100)	10 (100)	15 (88)	29 (94)	0.4146
Occasionally	0	0	2 (12)	2 (6)	
Never flatal incontinence	4 (100)	10 (100)	17 (100)	31 (100)	
Straining to defecate					
Always	0	0	1 (6)	1 (3)	0.3255
Never	4 (100)	7 (70)	15 (88)	26 (84)	
Occasionally	0	3 (30)	1 (6)	4 (13)	
Constipation					
Always	0	0	1 (6)	1 (3)	0.4634
Never	3 (75)	7 (70)	15 (88)	25 (81)	
Occasionally	1 (25)	3 (30)	1 (6)	5 (16)	
Sensation of incomplete bowel emptying					
Never	4 (100)	9 (90)	11 (65)	24 (77)	0.4393
Occasionally	0	1 (10)	5 (29)	6 (19)	
Weekly	0	0	1 (6)	1 (3)	
Digitation					
Always	0	0	1 (6)	1 (3)	0.7797
Never	4 (100)	10 (100)	15 (88)	29 (94)	
Occasionally	0	0	1 (6)	1 (3)	
Splinting					
Never	4 (100)	10 (100)	16 (94)	30 (97)	0.6534
Occasionally	0	0	1 (6)	1 (3)	

preoperative mixed incontinence did not reach statistical significance [Tables 3.2–3.5]. This is probably due to the difficulty in achieving statistical significance when the event of SUI recurrence is rare, following the probability of observing it by chance alone as low, and larger sample sizes are required to achieve adequate statistical power.

Further discussion will focus on the case of a patient with recurrent SUI. The patient is a 63-year-old woman who underwent surgery at the age of 53 years old due to urodynamic stress incontinence and POP Stage 4 (C). She currently works as a fish vendor and engages in daily lifting of at least 5 kg of weight. Her urinary complaints include occasional urgency, urge incontinence, and a sensation of incomplete emptying, which started 3 years ago. She denies SUI but experiences occasional dyspareunia and vaginal discharge. She does not report any sensation of prolapse, palpable vaginal bulge,

or changes in bowel habits. The patient followed up 10 years after her surgery (pubovaginal sling, vaginal hysterectomy, culdoplasty, colporrhaphy, and BICF). The patient’s POP-Q measurements were normal (Ba-3, Bp-3, Vault-7) at 1-year follow-up. However, there was POP stage II (Ba + 1, Bp + 1, Vault + 1) recurrence at her 10-year follow-up. Office cystometry combined with cough stress test was conducted and revealed occult SUI, she was able to void with no urinary retention upon straight catheterization. The authors suggest that her SUI recurrence is reflective of the failure rate of incontinence procedures which can reach 50% at 5-year follow-up.^[5] Meanwhile, her POP recurrence can be supported by risk factors such as young preoperative age, advanced primary POP stage, and level of activity. Few studies^[24,25] have examined the risk of cystocele recurrence after suburethral sling placement or the influence of cystocele on the efficacy of suburethral sling

Table 5.1 Pelvic organ prolapse recurrence per compartment and at short-, mid-, and long-term follow up

			Years from surgery			Total
			Short-term (<3 years)	Mid-term (3 to 5 years)	Long-term (>5 years)	
POP	Anterior	Count	0	4	2	6
		# within years from surgery	0.0%	40%	11.8%	19.4%
	Central (vault)	Count	0	0	3	3
		# within years from surgery	0.0%	0.0%	17.6%	9.7%
	Posterior	Count	4	6	11	21
		# within years from surgery	100%	60%	64.7%	67.7%
	No recurrence	Count	0	0	1	1
		# within years from surgery	0.0%	0.0%	5.9%	3.2%
Total		Count	4	10	17	31
		# within years from surgery	100%	100%		100%

	Value	df	Asymp. Sig (2-sided)
Pearson Chi-square	7.503a	6	0.277
Likelihood Ratio	9.273	6	0.159
Never of valid cases	31		

^a10 cells (83.3%) have expected count less than 5. The minimum expected count is 13

procedures. In this study, no association was found between SUI recurrence and anterior compartment prolapse or vice versa.

Interestingly, the maximum bladder capacity was found to be small in 22% of patients, with an average capacity of 370cc. Four out of seven patients who had small bladder capacities reported occasional urgency and urge incontinence in the long term, while three out of seven were observed in the mid-term. There was an association with urinary frequency from the duration of time from surgery ($P = 0.027$). However, it is important to note that de novo overactive bladder (OAB), which persists for 6 months in some patients after anti-incontinence surgery,^[23] is not applicable to the patients in this study who are already in the mid-term and long-term follow-up. Literature^[12,26] suggests that older women may void less efficient overall and have increased postvoid residual. It is noted that the prevalence of OAB increases with age possibly due to myogenic and afferent pathways changes that occur overtime rather than it being a direct consequence of sling surgery.

One case of urine retention was also observed. This patient, a 66-year-old woman, had surgery at 61 years old and underwent pubovaginal sling, vaginal hysterectomy, colporrhaphy, and culdoplasty. She experienced intermittent catheterization for 1 month postoperatively but was lost to follow-up after 1 year. The patient reported occasional sensation of incomplete emptying for the past 5 years, without changes in bowel habits or vaginal complaints. Office cystometry revealed stable bladder function with a maximum cystometric capacity of 350 cc. The patient showed no signs of stress incontinence during the cough stress test but had 42% urine retention upon straight catheterization. Although it is infrequent

(1 out of 31) in our study, voiding dysfunction may be more problematic than SUI, as patients are subjected to prolonged catheterization, UTI, and possible release of sling. A prospective study by Natalin *et al.*^[27] reported that higher incidences of outlet obstruction are observed with autologous slings (12.8%–50%) versus (2.5%–12.5%) with synthetic slings.

It is also notable that mesh erosion occurred in only 1 participant, consistent with synthetic sling erosion risk at 0.4%–1.5% as reported by the European Commission’s Scientific Committee on Emerging and Newly Identified Health Risks.^[28] This is after following a general notice from the US Food and Drug Administration report in 2011 regarding severe vaginal mesh complications while failing to differentiate between mesh for incontinence and mesh for prolapse.

Meanwhile, the objective and subjective cure rates of concomitant prolapse surgeries were 67.7% and 94%, respectively. This is in comparison to a systematic review and meta-analysis study^[29,30] which reported an overall success rate of 78.3%. In this study, the overall POP recurrence rate was 32.25%. There were 12 out of 15 patients (80%) who underwent BICF without apical prolapse recurrence and 3 out of 15 patients with fixation with apical prolapse recurrence. However, there was not enough evidence to show that BICF is protective against apical prolapse recurrence in this study. This is in contrast to a local study by Alatraca-Malonzo and Prodigalidad-Jabson^[31] comparing POP recurrence among groups who had fixation, and those without, wherein recurrence was significantly lower in the fixation group (23.39%) after a mean follow-up of 28.98 months. The authors believe that although there was a recurrence of apical compartment prolapse in 3 out of 15 patients who underwent the fixation procedure, it is significant to note that these recurrences occurred only in patients who were followed up in the long term. This observation suggests a protective effect of the fixation procedure, which may be better appreciated in a larger study population.

Table 5.2: Association of bilateral iliococcygeal fixation with central/apical prolapse at short, mid- or long-term follow-up

Central/apical compartment prolapse recurrence	Short-term (n=4)	Mid-term 3–5 years (n=5)	Long-term (n=6), n (%)	P
With bilateral iliococcygeal fixation	0	0	3 (207)	0.066
Central/apical compartment prolapse recurrence	Short-term (n=0)	Mid-term 3–5 years (n=5)	Long-term (n=11), n (%)	P
Without bilateral iliococcygeal fixation	0	0	0	Not applicable
Association of bilateral iliococcygeal fixation and anterior compartment prolapse recurrence				
Anterior and posterior colporrhaphy, levator myorrhaphy with bilateral iliococcygeal fixation	No anterior compartment prolapse recurrence (n=25), n (%)		Anterior compartment prolapse recurrence (n=6), n (%)	P
Anterior and posterior colporrhaphy, levator myorrhaphy without bilateral iliococcygeal fixation	12 (48)		4 (66.7)	0.411

Table 6.1: Association of known risk factors to recurrence of pelvic organ prolapse-age

	Posterior compartment recurrence			Central (vault) compartment recurrence			No recurrence			Anterior compartment recurrence			Total			P
	Mean	n	SD	Mean	n	SD	Mean	n	SD	Mean	n	SD	Mean	n	SD	
Preoperative age	62.00	1		54.00	3		64.52	21	6.911	54.38	6	6.675	61.29 years old	31	8.259	0.004*

SD: Standard deviation

Table 6.2: Association of known risk factors to recurrence of pelvic organ prolapse – postoperative genital hiatus^a

Postoperative GH	POP						P
	Anterior	Central (vault)	No recurrence	Posterior	Total		
2	0	0	1	0	1	0.064	
3	1	2	16	0	19		
4	3	1	3	0	7		
5	2	0	1	1	4		
Total	6	3	21	1	31		
Chi-square tests	Value	df	Asymptotic significant (two-sided)				
Pearson Chi-square	16.116*	9	0.064				
likelihood ratio	14.174	9	0.116				
Number of valid cases	31						

^a15 cells (93.8%) have expected count <5. The minimum expected count is 0.03. POP: Pelvic organ prolapse, GH: Genital hiatus. ^bBased on reports of postoperative genital hiatus >5 cm as a risk factor to POP recurrence, irrespective of vaginal compartment⁽³³⁾

Table 6.3: Association of known risk factors to recurrence of pelvic organ prolapse – preoperative perineal body^b

Preoperative PB	POP						P
	Anterior	Central (vault)	No recurrence	Posterior	Total		
2	5	2	14	1	22	0.784	
3	1	1	7	0	9		
Total	6	3	21	1	31		
Chi-square tests	Value	df	Asymptotic significant (two-sided)				
Pearson Chi-square	1.070*	3	0.784				
Likelihood ratio	1.392	3	0.707				
Number of valid cases	31						

^bBased on reports of postoperative genital hiatus >5 cm as a risk factor to POP recurrence, irrespective of vaginal compartment, ^bBased on reports of preoperative perineal body <2 cm as a risk factor to POP recurrence, irrespective of vaginal compartment, ^a6 cells (75.0%) have expected count <5. The minimum expected count is 0.29. POP: Pelvic organ prolapse⁽³³⁾

Aside from young age (mean 54.38 years), the authors were not able to generate statistically significant results with regard to known predictors of POP recurrence.^[32,33] advanced primary POP stage, preoperative and postoperative perineal body, and genital hiatus measurements were not statistically significant in this study. This is in comparison with

larger studies^[32-34] where preoperative perineal body and increased genital hiatus, in addition to Body mass index, longer duration of menopause, and lifestyle were observed as risk factors to recurrence of POP.

Furthermore, after an average follow-up period of 7 years, no symptoms of prolapse were reported in the

majority of patients. Specifically, out of the 31 participants in our study, 29 (94%) reported no complaints of POP symptoms. These findings suggest that the concomitant prolapse surgery was satisfactory over an extended period of time.

Limitations

The strengths of our study include having objective and subjective evaluations with results available for short-, mid-, and long-term evaluation of postoperative patients. We acknowledge the inherent possible sampling error and selection bias of our study, especially with a general lack of interest of the target population, which may possibly be a consequence of the pandemic scare.

Recommendations

This study has a heterogeneous population consisting of concurrent surgeries for uterovaginal prolapse, vault prolapse, urodynamic, occult and mixed stress incontinence, and patients who underwent autologous and synthetic slings. We recommend a larger sample size which should employ a well-considered methodology to further evaluate these subsets of populations, including a regression analysis to study the variables that truly affect outcomes.

Conclusion

This study provides evidence for the durability and efficacy of combined surgeries for incontinence and prolapse, with a mean follow-up period of 7 years. The subjective assessment tools utilized in this study demonstrate that a combined procedure is highly satisfactory in addressing both SUI and POP in the short-, mid-, and long-term follow-up.

While an association was observed between frequency of urination and time elapsed since surgery, no significant differences in sexual and bowel symptoms were noted among participants. Preoperative age was the only known factor found to be statistically significant in predicting prolapse recurrence. Notably, complications associated with combined surgery were rare in this study.

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Conflicts of interest

There are no conflicts of interest.

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